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construction of the motions, that they are instantly effective, and in their directions afford every facility and convenience requisite for minute research.

It was suggested to me when constructing the instrument, that the screw for moving the triangular tube can be used as a micrometer, by successively bringing the upper and under surface of any transparent object into distinct vision, and observing the number of revolutions or parts of a revolution passed through by the micrometer head. The screw Mr. Ross has applied contains 50 revolutions in an inch, and the head is divided into 100 parts, making each division = $\frac{1}{5000}$ of an inch, and with some of the Wollaston doublets made by the same artist, in which the focus is very precise, I can measure the diameter of a vessel, or the thickness of a cuticle, within one of these divisions.

ON PRESERVING ANIMALCULÆ.

Note supplementary to Mr. Varley's Paper on the Microscope.

Water stocked with vegetation is likely to abound in animalculæ; therefore during warm weather we seldom fail of finding great varieties in ponds and stagnant ditches. Also, any vegetable matter suffered to decay in water, with free access of air, produces animalculæ. Such stagnant water is liable to become so foul and disgusting as to kill all the larger sort, and yet will abound with a very minute sort rather peculiar to that state. Wishing to examine these varieties, we are frequently tempted to endure the offensive nuisance. If whilst some vegetable matter is dissolving, other plants are in a healthy growing state, the water will be kept sweet, and the most beautiful and interesting animalculæ will thrive; but the water is liable occasionally to become foul throughout, or the deposit at bottom becomes foul, and when this is the case the animalculæ can only live at the top. In some cases I have removed the whole of this offensive deposit from the bottom of a glass jar or vial, by the tube fig. 30 or 31, Plate IV., putting it to the bottom quite empty, and then letting it fill; and by replacing my finger at top, lifting it out, and then adding rain-water to fill up the jar, if I wish to preserve the particular kinds of animalculæ that are already in the jar; for common cistern-water is liable to bring some of their enemies with it.

Having various jars, some stocked with vegetation and others with animalculæ, all within doors, I removed entirely all disagreeable smell or effluvia from the room, and kept a sense of perfect sweetness, by leaving a bottle of nitric acid open in the room. The success of this made me try to cure the water as well as the room: I therefore put a few drops of nitric acid in a glass of water, so as to produce only a pleasant taste when the tongue was dipped into it, and not a sharpness. I then took tubes full of this, and putting the end down to the bottom of the jar, removed my finger from the top, and breathed into the tube just enough to expel the acidulous water, but not to let the air bubble through. This had the desired effect; for in a day or two the animalculæ were found much nearer to the bottom. From a glass jar holding about half a gallon of water, in which a large quantity of vegetable matter was put to decay, that it might become food for *chara*, the smell had become strong and disagreeable. To this I added about a wine-glassful of acidulous water, in very small quantities at a time, by means of the glass tube, and each portion was expelled from the tube into different parts of the jar, so as to mix it as equally as possible with the water. This, though six or eight weeks since, has, up to the present time, removed all smell from the water, and left it well stocked with animalculæ, among which are plenty of bell polypus, and *chara* is growing up from the bottom ; but it has prevented those myriads of minute animalculæ that appear to be the only substance remaining at the surface of such stinking water.

My reason for trying the nitric acid in this case, was its success in preventing contagion, having from my infancy used its vapour for that purpose. It removes all smell or sense of closeness from a sick chamber, thereby encouraging the humanity of attendance. From whatever cause, either of uncleanliness or otherwise, a place contracts a disagreeable smell, I have found the nitric acid fumes restore it to perfect sweetness, and therefore I expected it to remove the smell from vessels containing animalculæ; and now I find, by a cautious use, it will do so without killing them. By leaving a bottle of the acid open in a room, it produces only a very slight and pleasant smell of the acid when we come fresh into the room, but not enough to be sensible whilst remaining in it; and living in such an atmosphere, during the prevalence of any contagion, has rendered me fearless of going into any place of danger from such a cause. For on one occasion, when influenza attacked a great many persons in London, every person in our house was affected but myself and brother, we being chiefly occupied in a room that I had so guarded, by placing a two-ounce vial of nitric acid on the mantle-shelf; yet we had been most exposed by visiting families where it prevailed. I have added this statement to draw attention to the use of these fumes at the present period, an alarm of contagion being abroad.*

⁂ In the reference to fig. 33, page 389, the texture of minute cells is said to cover the outside of all the tubes. This is a mistake: the tubes are all tough, strong, and clear, being quite transparent; the cellular tissue forms the extremely thin and tender inside tube, or rather two semi-tubes, between which and the outer tube the fluid circulates. These semi-tubes adhere to the outer at the transparent spiral lines which divide the up and down currents.

CORNELIUS VARLEY.

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* The vapour of nitrous acid was used by Dr. Carmichael Smith, in 1780, for destroying the miasmata of certain infectious diseases.